Volunteer Lake Assessment Program Individual Lake Reports

BEARCAMP POND, SANDWICH, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	7,680	**Max. Depth (m):**	9.2	**Flushing Rate (yr^{-1})**	8.5
Surface Area (Ac.):	167	**Mean Depth (m):**	2.7	**P Retention Coef:**	0.46
Shore Length (m):	4,200	**Volume (m^3):**	1,769,500	**Elevation (ft):**	596

TROPHIC CLASSIFICATION

Year	Trophic class
1982	MESOTROPHIC
1998	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

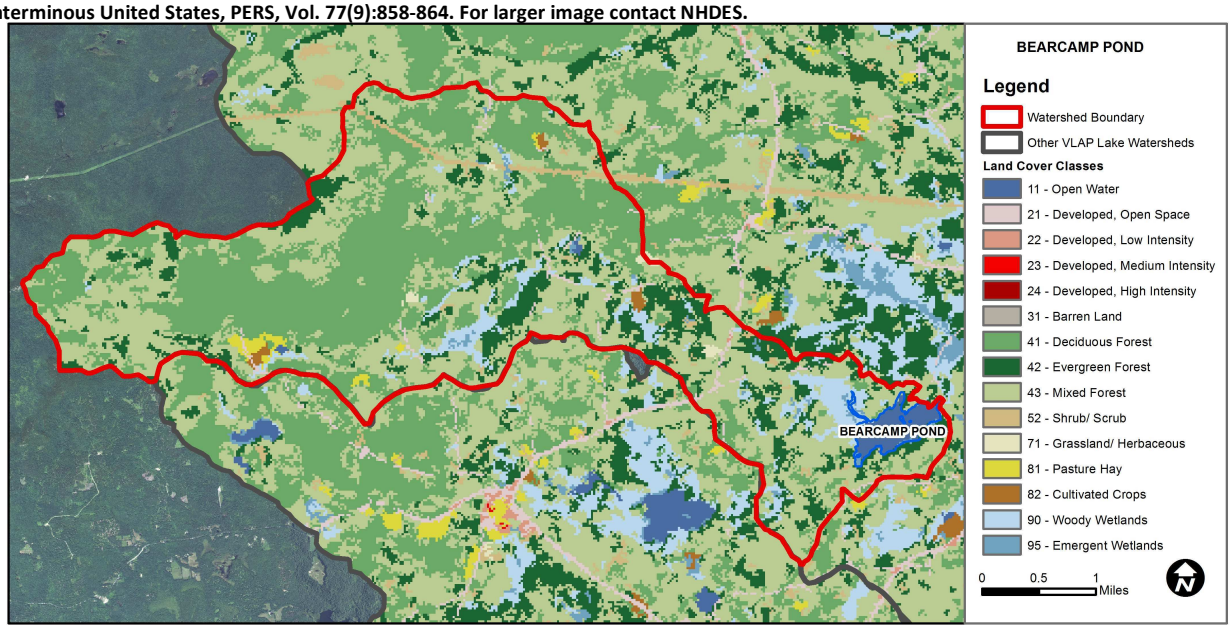
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Good	There are at least 10 samples with one, but < 10% of samples, exceeding criteria.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Good	There are at least 10 samples with one, but < 10% of samples, exceeding indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BEARCAMP POND - TOWN BEACH	Escherichia coli	Good	There are geometric means and all geometric means are < geometric mean criteria; and there has been a single sample exceedance.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	1.76	Barren Land	0	Grassland/Herbaceous	0.3
Developed-Open Space	0.92	Deciduous Forest	36.89	Pasture Hay	0.66
Developed-Low Intensity	0.01	Evergreen Forest	12.32	Cultivated Crops	0.36
Developed-Medium Intensity	0	Mixed Forest	39.88	Woody Wetlands	4.87
Developed-High Intensity	0	Shrub-Scrub	1.36	Emergent Wetlands	0.58

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Bearcamp Pond, Sandwich

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels were low in June, increased to elevated levels in July, and decreased to slightly elevated levels in August. Average chlorophyll levels increased slightly from 2013 and were greater than the state median. The pond has a history of elevated algal growth in mid to late summer months and it appears this is a normal pattern for the pond as historical trend analysis indicates stable chlorophyll levels with low variability between years.
- **Conductivity/Chloride:** Deep spot and tributary conductivity levels remained low and much less than the state median. Historical trend analysis indicates relatively stable epilimnetic (upper water layer) conductivity since monitoring began.
- **E. coli:** Partridge Hill Beach and Swim Area E. coli levels were much less than the state standard of 88 cts/100 mL for public beaches.
- **Total Phosphorus:** Epilimnetic and Metalimnetic (middle water layer) phosphorus levels were stable and low from June through August. Average epilimnetic phosphorus decreased from 2013 and was less than the state median. Historical trend analysis indicates highly variable epilimnetic phosphorus levels since monitoring began. Hypolimnetic (lower water layer) phosphorus levels were in an average range and increased gradually as the summer progressed and dissolved oxygen levels decreased potentially resulting in phosphorus being released from bottom sediments, a process called internal loading. Inlet and Pre-Inlet phosphorus levels were slightly elevated in June and July following storm events and then decreased to average levels in August. Outlet phosphorus levels remained stable and low.
- **Transparency:** Transparency measured without the viewscope (NVS) was good in June, remained stable in July, and then decreased to low levels in August. Average transparency improved in 2014 and was better than the state median. Transparency measured with the viewscope (VS) was very good in June and then decreased in July likely due to the elevated algal growth. Historical trend analysis indicates highly variable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity increased slightly in July with the elevated algal growth but generally remained within an average range. Metalimnetic turbidity increased slightly in July and August with the elevated algal growth. Hypolimnetic turbidity increased as the summer progressed and organic compounds accumulated in hypolimnetic waters. Inlet and Pre-Inlet turbidities were slightly elevated in June and July following storm events. Outlet turbidity was low.
- **pH:** Epilimnetic pH was generally within the desirable range 6.5-8.0 units however Metalimnetic and Hypolimnetic pH levels were much less than desirable. Historical trend analysis indicates highly variable epilimnetic pH since monitoring began.
- **Recommended Actions:** Inlet and Pre-Inlet phosphorus and turbidity levels were slightly elevated following storm events in June and July indicating potential erosion upstream. Dirt and gravel roads may be contributing sediment and phosphorus to the Inlet during high intensity storm events. If possible, encourage the town to investigate potential stormwater management solutions to prevent dirt road erosion. The U.S. Forest Service's "Environmentally Sensitive Road Maintenance for Dirt and Gravel Roads" is a good resource. Also educate lake residents on ways to reduce stormwater runoff from their properties utilizing DES' "NH Homeowner's Guide to Stormwater Management". Keep up the great work!

Station Name	Table 1. 2014 Average Water Quality Data for BEARCAMP POND								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	4.23	6.65	22.3		8	3.40	3.88	0.90	6.57
Metalimnion			22.3		9			1.28	5.90
Hypolimnion			23.4		13			2.42	5.91
Inlet			27.3		13			1.21	6.32
Outlet			22.8		7			0.58	6.64
Partridge Hill Beach				2					
Pre-Inlet			27.3		13			1.17	6.74
Swim Area				10					

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data moderately variable.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Stable	Trend not significant; data highly variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.